NASA TECH BRIEF

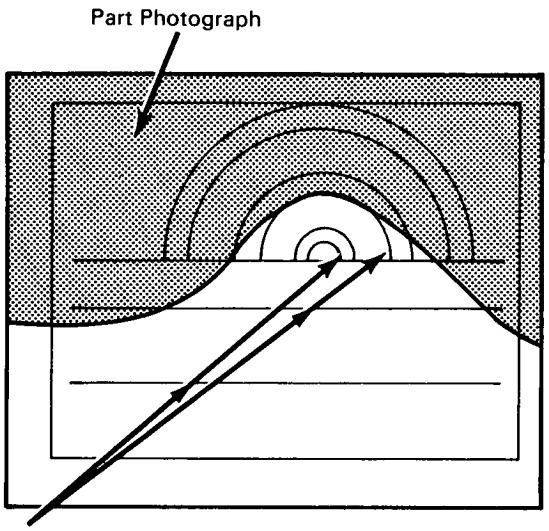
Photomicrometrology

The problem:

To determine accurately the physical dimensions (angles, contours, etc.) of the microscopic details of very small components which must meet exceedingly fine tolerances.

The solution:

A method known as photomicrometrology that combines microphotography with standard measuring techniques. Where a microphotograph cannot be directly applied due to the inaccessibility of the part involved, a mold can be used to determine the angle or contour of interest.



How it's done:

A photograph is taken through a microscope, set at a predetermined level of magnification, and the resultant negative is overlayed on an optical scale of the same magnification, as shown in the sketch. In those cases where the location of interest does not permit direct microphotography, a standard commercially available molding plastic substance is used to make a reverse contour which can be removed and photographed through the microscope. This microphotograph is then measured in the same way to give the desired results.

Notes:

1. This technique has been successfully used to achieve proven measurements to 25 microinches.
2. Request for further information may be directed to:
   Technology Utilization Officer
   Marshall Space Flight Center
   Huntsville, Alabama 35812
   Reference: B69-10736

Patent status:

No patent action is contemplated by NASA.

Source: F. L. Young of
North American Rockwell Corporation
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Category 01